SEPTEMBER 2012

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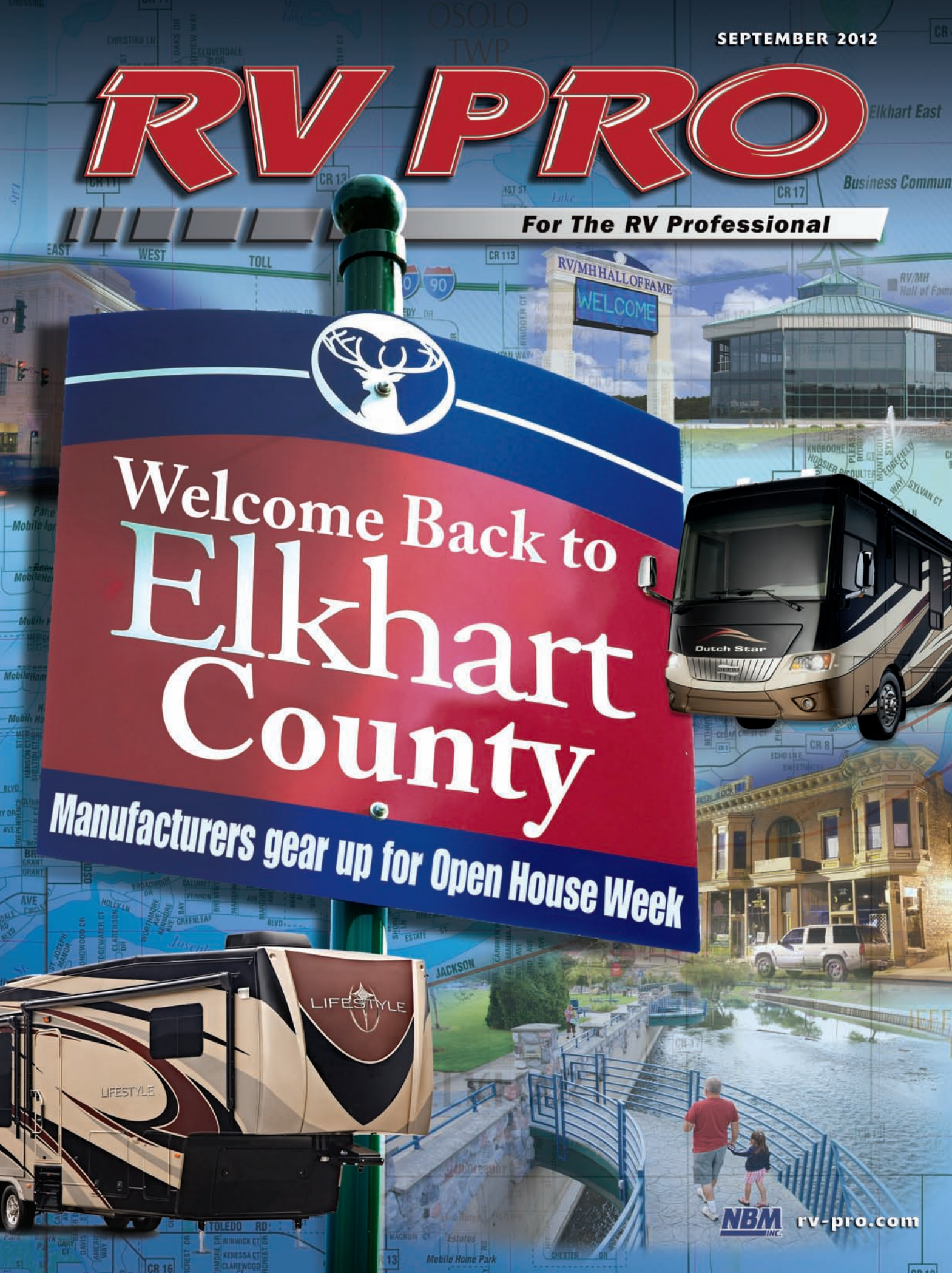

Waste: The Profitability Killer

Part one of this two-part series identifies four common types of waste, how they detract from productivity and how to fix them. Part two will examine and seek to rectify additional wastes.

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One of the biggest issues facing U.S. manufacturers today is profitability, or the lack of it. Some claim it is due to stiff competition that eats away at ever-shrinking margins, but many times it is something else.

There are two primary ways to increase profitability: raise prices or reduce costs. For most, however, raising prices is not permitted by the market environment, so the only thing left to do is to reduce costs.

Traditionally, this has meant layoffs of hourly and salaried workers and the elimination of overtime, but I suggest that there is a much better way to do it using the untapped opportunities that most manufacturers have but are not fully exploiting.

How do you reduce costs? I recommend the identification and the elimination of all types of waste. That is what we will be discussing in this issue and the subsequent one.

Waste is a common term with a broad base of meanings. What we are talking about here is wasteful or unproductive activities that do not add value to the product or process.

Manufacturing waste also can be defined as the unnecessary use of resources beyond what is necessary. It is a rather broad subject that can be explained by categories as originated by Taiichi Ohno as part of the Toyota Production System. Lean practitioners will recognize the categories as the "Eight Forms of Waste."

These subjects are far-reaching, but will be summarized to touch on the important areas. Many of these wastes are interrelated, in that if you solve one issue you may solve other issues at the same time. Virtually every wasteful practice in any endeavor can be classed into one of the following categories.

Transportation Waste

Transportation waste is basically the unnecessary movement of "things" such as raw materials, parts, subassemblies or finished goods, from one place to another. Examples would include: moving materials out of the way in order to get to other materials, moving materials from a warehouse to the production area, moving materials from one operation to another, or trucking materials to and from suppliers.

Automotive manufacturers have recognized the value in reducing this waste by requiring some of their suppliers to be located in close proximity to

Transportation waste, inventory waste, motion waste and the waste of waiting can all be tremendously damaging to manufacturing productivity and efficiency.

their assembly plants and then optimizing the material movement and production flow to an extremely high level.

You may say, "How does this apply to me?" Initially, I would suggest focusing on material movements in and around your facility to see if you have any transportation wastes. Observe and document your material handling moves and record them as necessary-moves (valued-added) or unnecessary moves (non-value added). What can be changed to reduce or eliminate some moves? Would a piece of conveyor replace a hand jack?

It is also a good idea to draw the path that your product or materials take through your facility. If you measure the distances involved you may be shocked, but it can also serve as a baseline from which to measure any improvements. Also observe your workers and note long walks to get materials. This is where you ask "why" and see if those materials can be moved closer to the worker to eliminate the unnecessary transportation of those things.

Sometimes transportation waste is a result of a poor plant layout design. Developing an actual as-is layout and then studying your process flow is the best way to identify and correct these issues. You may have to move machinery, relocate storage areas, or any number of similar steps to reduce this waste.

If you do these things you may also notice a reduction in forklift fuel usage, or a reduction in the required inventory levels and other peripheral savings. This may seem very obvious, but I see extreme examples of this virtually every day in my work. Unless you intentionally pay attention to, observe, and document this, you may not even notice it is going on.

Inventory Waste

Most everyone understands inventory waste, especially once it is pointed out to them, yet this is still a very common form of waste found in industry today. Inventory waste can consist of raw materials, work in process, finished goods, or all of them. At its core, this type of waste refers to the issues and the costs associated with having too much inventory on hand.

Why is too much inventory bad?

- It ties up your cash.
- It causes excess material handling effort and labor to keep moving things around to get to other things and counting it.
- It causes damaged goods because of high stacking, re-handling, or fork trucks running over product or spearing boxes.
- It causes spoilage. Steel rusts, adhesives age, plastics fade, things get crushed
- It causes scrap or rework when there are engineering changes.
- It occupies valuable floor space
- And the list goes on.

How do we get ourselves into this state? Sometimes it is caused by the fear of running out of something. Sometimes inexperienced buyers are drawn into buying volume in order to get a better price. Sometimes supervisors produce subassemblies as busy work, which increases WIP (work in progress) and commits materials.

Whatever the reason, the costs are high. I suggest meeting with the buyers, make sure they understand the problem and do a better job of purchasing by justifying order quantities or requiring vendors to store the material. Systematically go through your inventory and discard obsolete and damaged items; attempt to return excess materials to the vendors, segregate rework or rejected materials for disposition, and update your inventory counts. Stop manufacturing from producing unnecessary WIP or finished goods. This process is not fast, but the rewards are great.

Motion Waste

Motion waste generally refers to the unnecessary movement of "people" or the unnecessary motions made by people; however, it also applies to extra and unnecessary moves made by machinery as well.

Many times wasted operator movement was unknowingly designed-in by maintenance, engineering or machine vendors who build machines or work stations without considering any real ergonomic factors and with little or no thought to the operator's required movements. I have seen cycle-start buttons on machines that you had to walk to in order to get to them.

I have also seen machines and workstations way too high or way too low for the operators. What this causes is wasted movements that you are paying for. In addition, it slows the operator down from doing the work and fatigues them too soon and unnecessarily.

Machine cycles are a hidden source for wasted motion. Frequently I see machines cycling and making movements that have no purpose except for consuming time and resources. Sometimes this is caused by human error, but many times it is a result of a product change or a well-meaning maintenance worker trying to get the equipment back online after a problem.

Probably the No. 1 reason for motion waste is the lack of written workplace methods. By that I mean a written method of performing the work that has been proven to be the most efficient method and which contains the least amount of wasted motion and delays. This is usually accompanied by a workplace layout showing the placement of the materials and containers. Method descriptions are very different from work instructions, as their purposes are very different.

Most companies simply show the employee what they want them to do and leave it to them to figure out the best way to do it. Sometimes another self-taught employee trains the new man using less than ideal methods. This is not always the best idea. As long as the work is getting done, managers can be lulled into thinking they are efficient when they are not.

The only way to discover and eliminate motion waste is by systematically spending time observing each operation and/or machine cycle individually. Each task should be broken down into its steps or work elements. I find that using basic time study methodologies work great for this. However, it can be done without doing a time study by simply observing and looking for the wasted motions and the "stupid stuff," as I call it.

During these periods of observation, you will notice the wastes. Tools and materials located too far away; finished goods containers or conveyors inappropriately

positioned, hindering easy access; obstacles like columns interfering with efficient movements; extra useless handling or staging of the parts; poor positioning of buttons or control panels; poor lighting or ventilation, and the list goes on.

The same is true for machine cycles. Carefully watch machine cycles and look for useless moves, pauses or unexplained events. I like to get the original vendor specs with the original cycle time and compare that to the current time. You may be very surprised at what you find.

The Waste of Waiting

Like inventory waste, the waste of waiting is very easy to understand, but it is also easy to overlook and can be hidden if you do not pay close attention and look for it.

What are some examples of waiting waste or idle time?

- Waiting for the material handler to deliver parts to the line.
- Waiting for a tool or work assist device to become available.
- Waiting for the machine cycle to stop to unload/reload the machine.
- Waiting for an empty pallet.
- Work delays caused by operations, either upstream or downstream.
- Inconsistent or unreliable processes.

Waiting waste also results from bottlenecks on assembly lines, mismatched work quantity between two or more operators, or between an operator and a machine. Many times operators who are actually waiting will work slowly to fill the time so it does not look like they are waiting.

All waiting is bad and costly and should be eliminated or minimized. Like motion waste, the only way to discover it is to spend time observing each operation. Once the wait time has been discovered it is now time to make process changes in an effort to reduce or eliminate it. This process of trial and error is known as continuous improvement. If something doesn't work, try something else.

In the next issue we will explore the four remaining forms of waste in this series: over-production, over-processing, scrap/defects and intellect. See you then. PRO